UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
UNDERGROUND INJECTION CONTROL MAJOR PERMIT MODIFICATION: CLASS II COMMERCIAL

Permit Number: MI-147-2D-0022

Facility Name: Deep Blu #1-2 HD1 BDW

Pursuant to the provisions of the Safe Drinking Water Act, as amended 42 U.S.C. §§300f et seq., (commonly known as the SDWA) and implementing regulations promulgated by the U.S. Environmental Protection Agency (EPA) at Parts 124, 144, 146 and 147 of Title 40 of the Code of Federal Regulations (40 CFR),

Deep River Energy, LLC of St. Clair, Michigan

is hereby authorized to continue operation of an existing injection well located in Michigan, St. Clair County, T6N, R16E, Section 2, 1/4 Section SE, for injection into the Lucas, Amherstburg and Bois Blanc Formations at depths between 1070 and 1447 feet, upon the express condition that the permittee meet the restrictions set forth herein.

The purpose of the injection is for commercial disposal of fluids brought to the surface in connection with natural gas storage or conventional oil or natural gas production as approved by the Director.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is effective.

This is a major modification of a permit that was signed on June 29, 2011, and modified previously on November 21, 2013. This modification shall become effective on _____ and shall remain in full force and effect during the operating life of the well, unless this permit is otherwise revoked, terminated, modified or reissued pursuant to 40 C.F.R. §§144.39, 144.40 and 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless the State chooses to adopt this permit as a State permit. This permit will be reviewed at least every five (5) years from the effective date specified above.

Signed and dated: November 13, 2015

Tinka G. Hyde

Tinka G. Hyde
Director, Water Division

PART I
GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit or rule, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water if the presence of that contaminant may cause a violation of any Primary Drinking Water Regulation pursuant to 40 CFR Part 142 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit or otherwise authorized by permit or rule is prohibited. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Section 1431 of the Safe Drinking Water Act (SDWA), or any other law governing protection of public health or the environment.

B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 144.39, 144.40, and 144.41. The filing of a request by the permittee pursuant to 40 CFR 144.51(f) for a permit modification, revocation and reissuance, termination, or the notification of planned changes or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR Part 2 and 144.5, any information submitted to the USEPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, USEPA may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in 40 CFR Part 2 (Public Information). Claims of confidentiality for the following information will be denied:

1. The name and address of the permittee; and

2. Information which deals with the existence, absence or level of contaminants in

drinking water.

E. DUTIES AND REQUIREMENTS

1. **Duty to Comply** - The permittee shall comply with all conditions of this permit, except to the extent and for the duration such non- compliance is authorized by an emergency permit pursuant to 40 CFR 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance or modification.

2. **Penalties for Violations of Permit Conditions** - Any person who constructs or operates this well in violation of permit conditions is subject to civil penalties, fines, and other enforcement action under the SDWA and may be subject to such actions under the Resource Conservation and Recovery Act. Any person who willfully violates a permit condition is subject to criminal prosecution.

3. **Need to Halt or Reduce Activity not a Defense** - It shall not be a defense for a permittee in an enforcement action to state that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. **Duty to Mitigate** - The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

5. **Proper Operation and Maintenance** - The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

6. **Duty to Provide Information** - The permittee shall furnish to the Director any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit within thirty (30) days of the request. Upon request, the permittee shall also furnish to the Director copies of records required by this permit to be retained.

7. **Inspection and Entry** - The permittee shall allow the Director or an authorized representative upon the presentation of credentials and other documents as may be required by law to:

   (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of

this permit;

(b) Have access to and copy, at reasonable times, any records that must be retained under the conditions of this permit;

(c) Inspect, at reasonable times, any facilities, equipment (including monitoring equipment), practices, or operations, regulated or required under this permit; and

(d) Sample or monitor the injected fluids, at reasonable times, for the purposes of assuring permit compliance, or as otherwise authorized by the SDWA, at any location.

8. Records

(a) Except as specified in Part I (E)(8)(b) of this permit, the permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all records required by this permit, for a period of at least three (3) years from the date of the sample, measurement or report. The permittee shall also maintain records of all data required to complete this permit application and any supplemental information submitted under 40 CFR 144.31 and 144.51. These periods may be extended by request of the Director at any time by written notice to the permittee.

(b) The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of plugging and abandonment in accordance with the plugging and abandonment plan contained in Part III (B) of this permit. The owner or operator shall continue to retain the records after the three (3) year retention period unless he/she delivers the records to the Regional Administrator or obtains written approval from the Regional Administrator to discard the records.

(c) Records of monitoring information shall include:

(i) The date, exact place, and the time of sampling or measurements;

(ii) The names of the individual(s) who performed the sampling or measurements;

(iii) A precise description of both sampling methodology and the handling of samples;

(iv) The date(s) analyses were performed;

(v) The names of the individual(s) who performed the analyses;

(vi) The analytical techniques or methods used; and

(vii) The results of such analyses.

9. Notification Requirements

(a) Planned Changes - The permittee shall notify and obtain the Director's approval at least thirty (30) days prior to any planned physical alterations or additions to the permitted facility, or changes in the injection fluids.

(b) Anticipated Noncompliance - The permittee shall give at least thirty (30) days advance notice to the Director for his/her approval of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements as required by 40 CFR §144.51(l)(2).

(c) Transfer of Permits - This permit is not transferable to any person except after notice is sent to the Director at least thirty (30) days prior to transfer and the requirements of 40 CFR 144.38 have been met. The Director may require modification or revocation of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.

(d) Compliance Schedules - Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Director no later than thirty (30) days following each schedule date.

(e) Twenty-Four Hour Reporting

(i) The permittee shall report to the Director any noncompliance which may endanger health or the environment. This information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall include the following information:

(a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or

(b) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

(ii) A written submission shall also be provided as soon as possible but no later than five (5) days from the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the

noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

(f) Other Noncompliance - All other instances of noncompliance shall also be reported by the permittee in accordance with Part I (E) (9) (e) (i) and (ii) of this permit.

(g) Other Information - If or when the permittee becomes aware that the permittee failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or corrected information in accordance with 40 CFR 144.51(l)(8).

(h) Report on Permit Review - within thirty (30) days of receipt of the final issued permit, the permittee shall report to the Director that the permittee has read and is personally familiar with all terms and conditions of this permit.

10. Commencing Injection - The permittee shall not commence injection until any corrective procedures described in Parts I(E)(16) and III (C) of this permit are complete, and;

(i) The permittee has submitted a report on the corrective work to the Director; and,

(ii) The Director has inspected or otherwise reviewed the corrective work and notified the permittee in writing that he/she is in compliance with the conditions of this permit.

11. Signatory Requirements - All reports or other information requested by the Director shall be signed and certified according to 40 CFR 144.32.

12. Notice of Conversion or Plugging and Abandonment - The permittee shall notify the Director at least forty-five (45) days before con-version or abandonment of the well.

13. Plugging and Abandonment - The permittee shall plug and abandon the well as provided in the plugging and abandonment plan contained in Part III(B) of this permit. Plugging shall occur as soon as practicable after operation ceases but not later than two (2) years thereafter. During the period of non-operation, the well must be tested to ensure that it maintains mechanical integrity, unless the permittee fulfills the other requirements under 40 CFR 144.52(a) (6), prior to expiration of the two (2) year period. The permittee shall notify the Director of plugging and abandonment in accordance with the reporting procedures in Part I (E) (12) of this permit.

14. Financial Responsibility - The permittee shall maintain financial responsibility and resources to plug and abandon the underground injection well in accordance with 40 CFR 144.52(a)(7) as provided in Attachment R of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The permittee shall not substitute an alternative demonstration of financial responsibility from that which the Director has approved, unless the permittee has previously submitted evidence of that alternative demonstration to the Director and the Director has notified the permittee in writing that the alternative demonstration of financial responsibility is acceptable. The financial responsibility mechanism shall be updated periodically, upon request of the Director, except that when Financial Statement Coverage is used as the financial mechanism, this coverage must be updated on an annual basis.

15. Insolvency

(a) In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as trustee or the institution issuing the financial mechanism to issue such an instrument, the permittee must submit an alternative demonstration of financial responsibility acceptable to the Director within sixty (60) days after such event. Failure to do so will result in the termination of this permit pursuant to 40 CFR 144.40(a) (1).

(b) An owner or operator must also notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within ten (10) business days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he/she is named as debtor, as required under the terms of the guarantee.

16. Corrective Action

The permittee shall shut in the injection well whenever he/she or the USEPA determines that operation thereof may be causing upward fluid migration through the wellbore of any improperly plugged or unplugged well in the area of review and shall take such steps as he/she can to plug the offending well(s) properly. Any operation of the well which may cause upward fluid migration from an improperly plugged or unplugged well will be considered a violation of this permit. If the permittee or the USEPA determines that the permitted well is not in compliance with 40 CFR 146.8, the permittee will immediately shut in the well until such time as appropriate repairs can be effected and written approval to resume injection is given by the Director. In addition, the permittee shall not commence injection until any and all corrective action has been taken in accordance with any plan contained in Part III(C) of this permit and the requirements in Part I(E)(10) of this permit have been met.

17. Mechanical Integrity

(a) The permittee must establish and shall maintain mechanical integrity of this well in accordance with 40 CFR 146.8.

(b) A demonstration of mechanical integrity in accordance with 40 CFR 146.8 shall be performed at least every five (5) years from the date of the last approved demonstration. The permittee shall notify the Director of his/her intent to demonstrate mechanical integrity at least thirty (30) days prior to such demonstration.

(c) The permittee shall demonstrate the mechanical integrity of the well by pressure testing whenever: (i) the tubing is removed from the well or replaced; (ii) the packer is reset; or (iii) a loss of mechanical integrity occurs. Operation shall cease whenever one of the aforementioned conditions occurs and not resume until the Director gives written approval to recommence injection.

(d) By written notice, the Director may require the permittee to demonstrate mechanical integrity at any time.

(e) The permittee shall cause all gauges used in mechanical integrity demonstrations to be calibrated prior to the demonstration.

(f) The permittee shall cease injection if a loss of mechanical integrity occurs or is discovered during a test, or a loss of mechanical integrity as defined by 40 CFR §146.8 becomes evident during operation. Operations shall not be resumed until the Director gives written approval to recommence injection.

(g) The permittee shall notify the Director of the loss of mechanical integrity in accordance with the reporting procedures in Parts II(B)(3)(d) and I(E)(9)(e) of this permit.

(h) The permittee shall report the result of a satisfactory mechanical integrity demonstration as provided in Part II (B) (3) (d) of this permit.

18. **Restriction on Injected Substances**

(a) **Currently Permitted Fluids** - The permittee shall be restricted to the injection of oil field brines or those fluids used in the enhancement of oil and gas production as specified in 40 C.F.R. 146.5(b). Further, no fluids other than those from sources noted in Part III (D) of the permit shall be injected.

(b) **Approval of New Sources** - Prior to accepting any new source of brine for disposal into the injection well, the operator must submit a request for a minor permit modification to include the new source in Part III (D) of the permit and must also submit a complete chemical analysis for each of the

parameters listed in Part III (A) to the USEPA for approval. The permittee may not inject fluids from the new source until the minor modification to the permit is effective.

(c) **Exceptional Circumstances** - If a state-mandated clean up, well flow back, or other urgent need for accepting a new source of oil-field brines arises, the permittee may inject such fluids providing: (i) notification is given to the USEPA by telephone at (312) 353-5498, within twenty-four (24) hours of the time injection commences; and (ii) a chemical analysis of the new source is submitted to the USEPA within thirty (30) days from the day injection commences. This temporary permission to inject terminates thirty (30) days after injection commences unless the permit is modified to add the new source to Part III (D) as provided in paragraph (b) above.

PART II
WELL SPECIFIC CONDITIONS FOR UNDERGROUND INJECTION CONTROL PERMITS

A. CONSTRUCTION REQUIREMENTS

1. Siting - Notwithstanding any other provision of this permit, the injection well shall inject only into a formation which is separated from any USDW by a confining zone that is free of known open faults or fractures within the area of the review.

2. Casing and Cementing - Injection wells shall be cased and cemented to prevent the movement of fluids into or between USDWs. The description of the casing and cement used in the construction of the well is contained in Attachments L and M of the administrative record corresponding to this permit action which is hereby incorporated by reference as if they appeared fully set forth herein.

3. Tubing and Packer Specifications - Injection shall only take place through tubing with a packer set in the long string casing adjacent to a cemented interval which is within or below the nearest impermeable confining system immediately above the injection zone. Tubing and packer specifications are represented in engineering drawings contained in Attachments L and M of the administrative record corresponding to this permit action which are hereby incorporated by reference as if they appeared fully set forth herein. Any proposed changes shall be submitted by the permittee in accordance with Part I (E) (9) (a) and (b) of this permit.

4. Wellhead Specifications - For every injection well, the operator shall provide a female fitting with a cutoff valve to the tubing at the wellhead, so that the amount of injection pressure being used may be measured by a representative of the USEPA by attaching a gauge having a male fitting.

5. Site Security – In order to prevent any illegal dumping into the injection well, the operator will either construct a manmade fence around the facility or where appropriate use the natural topography (forest, wetlands etc.) to preclude access by unauthorized personnel. In either case, a padlocked gate at the facility entrance shall be installed to control the access to the facility.

B. OPERATING, MONITORING AND REPORTING REQUIREMENTS

1. Operating Requirements

(i) Beginning on the effective date of this permit, the permittee is authorized to construct and operate the injection well, subject to the limitations and monitoring requirements set forth herein. The injection pressure and injected fluid shall be limited and monitored as specified in Parts I (E) (18) and III (A) of this permit.

(ii) Injection at a pressure which initiates fractures in the confining zone or causes the movement of injection or formation fluids into or between USDWs is prohibited.

(iii) Injection between the outermost casing protecting USDWs and the well bore is prohibited.

(iv) The annulus between the tubing and the long string casing shall be filled with a liquid designed to inhibit corrosion. The annulus liquid will be monitored and volume changes reported in accordance with Parts II(B)(2)(d) and II(B)(3)(b) of this permit. Any specific annulus requirements are contained in Part III (A) of this permit.

2. Monitoring Requirements

(a) Samples and measurements taken for the purpose of monitoring as required in Part II (B) (3) shall be representative of the monitored activity. Grab samples shall be used to obtain a representative sample of the fluid to be analyzed. Part III (A) of this permit describes the sampling location and required parameters for injection fluid analysis. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in Part III (A) of this permit.

(b) **Analytical Methods** - Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR 136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Director.

(c) **Injection Fluid Analysis** - The nature of the injection fluids shall be monitored as specified in Part III (A) of this permit. A complete chemical analysis of each source of brine that makes up the injection fluid is contained in Attachment H of the administrative record corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. By written notice, the Director may require the permittee to sample and analyze the injected fluid at any time.

(d) **Injection Pressure, Annulus Pressure, Annulus Liquid Loss, Flow Rate and Cumulative Volume** - Injection pressure, annulus pressure, flow rate and cumulative volume shall be recorded at least weekly and shall be reported monthly as specified in Part III(A) of this permit. Annulus liquid loss shall be recorded at least quarterly and shall be reported in accordance with the provisions of Part II(B)(3)(b), as the volume of liquid added to the annulus to keep it filled in accordance with Part II (B) (1) (iv). All gauges used in monitoring shall be calibrated in accordance with Part I (E) (17) (e) of this permit.

3. Reporting Requirements - Copies of the monitoring results and all other reports shall be submitted to the Director at the following address:

U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590
Attn: UIC Branch, Direct Implementation (WU-16J)

(a) Monthly Reports -Monitoring results obtained during each week shall be recorded on a form which has been signed and certified according to 40 CFR 144.32. Forms shall be submitted at the end of each month and shall be postmarked no later than the 10th day of the month following the reporting period. The first report shall be sent no later than the 10th day of the month following the month in which injection commences. This report shall include the weekly measurements of injection pressure, annulus pressure, flow rate and cumulative volume as required in Parts II (B) (2) (d) and III (A) of this permit.

(b) Quarterly Reports - Reports shall be submitted at the end of each quarter and shall be postmarked no later than the 10th day of the first month of the following quarter.

(i) Monitoring results obtained each quarter shall include the measurement of annulus liquid loss as required in Parts II (B) (2) (d) and III (A) of this permit.

(ii) Brine manifest records shall be submitted quarterly and must be either a copy of the State Report for commercial haulers or the permittee's records of deliveries by the various haulers, which shall include the following information: (1) name, address and phone number of the waste generator (producer), and name(s) and USEPA ID number(s) of the waste hauler(s); (2) the date(s) brine was unloaded at the disposal site and the volume of each load with the source identification number as shown in Attachment D of this permit. The brine manifest records must be accompanied by (1) a certification by the permittee that the waste contains no hazardous waste and that no non-oil and gas production waste was mixed with the brine; and (2) a report by the well operator sent to both the USEPA and the waste generator of any discrepancies in the injected volumes or place of origin as contained in the brine manifest records.

(iii) Monitoring results obtained each quarter shall include the measurements representative of injected fluid characteristics as required in Part III (A) of this permit.

(c) Annual Reports - All sources which contribute brine during each

calendar year shall be listed in the annual report by field name and source identification number as listed in Attachment D of this permit. Reports shall be submitted at the end of each calendar year and shall be postmarked no later than the 10th day of the first month of the following year.

(d) **Reports on Well Tests, Workovers, and Plugging and Abandonment**
The applicant shall provide the Director with the following reports and test results within sixty (60) days of completion of the activity:

(i) Mechanical integrity tests, except tests which the well fails in which case twenty-four (24) hour reporting under Part I(9)(e) is applicable;

(ii) Logging or other test data;

(iii) Well workovers (using EPA Form 7520-12); and

(iv) Plugging and abandonment.

PART III
SPECIAL CONDITIONS

These special conditions include, but are not limited to plans for maintaining correct operating procedures, monitoring conditions and reporting, as required by 40 CFR Parts 144 and 146. These plans are described in detail in the permittee's application for a permit, and the permittee is required to adhere to these plans as approved by the Director, as follows:

A. OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)

B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)

C. CORRECTIVE ACTION PLAN (ATTACHED)

D. INJECTED FLUIDS (ATTACHED)

E. ADDITIONAL REQUIREMENTS (ATTACHED - IF REQUIRED)

OPERATING, MONITORING AND REPORTING REQUIREMENTS

Characteristic	Limitation	Minimum Monitoring Requirements		Minimum Reporting Requirements
		Frequency	Type	Frequency
*Injection Pressure (maximum)	246 psig	weekly		monthly
Annulus Pressure		weekly		monthly
Flow Rate		weekly		monthly
Cumulative Volume		weekly		monthly
Annulus Liquid Loss		quarterly		quarterly
**Brine Manifest Records		daily		quarterly
***Chemical Composition of Injection Fluid		quarterly	grab	quarterly

SAMPLING LOCATION: Fluids will be collected from a tap located on the disposal string approximately two feet from the wellhead.

*The limitation on wellhead pressure serves to prevent confining-formation fracturing. The maximum injection pressure is dependent upon depth and specific gravity of the injected fluid. This limitation was calculated using the following formula: [{.80 psi/ft - (0.433 psi/ft) (specific gravity)} x depth] - 14.7 psi. The Lucas, Amherstburg and Bois Blanc Formations at 1070 feet was used as the depth and a specific gravity of 1.285 was used for the injected fluid.

**Brine manifest records must be either a copy of the State Report for commercial haulers or the permittee's records of deliveries by the various haulers. The brine manifest records must be submitted quarterly in accordance with Part II (B) (3) (b) of this permit and shall contain all the information specified therein.

***Chemical composition analysis shall include, but not be limited to, the following: Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Sulfide, Carbonate, Bicarbonate, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F), and Specific Gravity.

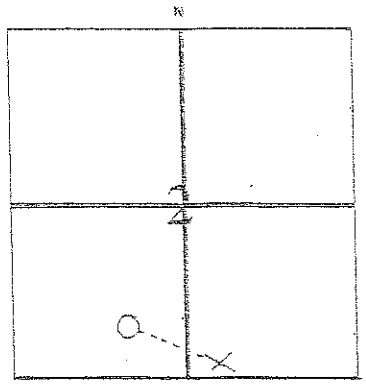
OMB No. 2040-0042 Approval Expires 12/31/2011

United States Environmental Protection Agency
Washington, DC 20460

PLUGGING AND ABANDONMENT PLAN

Name and Address of Facility	Name and Address of Owner/Operator
Deep River Energy, LLC 110 S. Third St., Ste 205, St. Clair, MI 48079	Deep River Energy, LLC 110 S. Third St., Ste 205, St. Clair, MI 48079

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Michigan	St. Clair	MI-147-2D-0022

Surface Location Description

___ 1/4 of SW 1/4 of SW 1/4 of SE 1/4 of Section 2 Township 6N Range 16E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 105 ft. from (N/S) S Line of quarter section and 614 ft. from (E/W) W Line of quarter section.

TYPE OF AUTHORIZATION
- [x] Individual Permit
- [ ] Area Permit
- [ ] Rule

Number of Wells 1

Lease Name: Deep Blu

WELL ACTIVITY
- [ ] CLASS I
- [x] CLASS II
  - [x] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [ ] CLASS III

Well Number #1-2 HD1 BDW

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT (LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
16"	55#	54'	54'	Driven
13-3/4	48#	324'	324'	14-3/4"
8-5/8"	24#	1,646'	1,646'	10-5/8"
5-1/2"	15.5#	5,464'MD, 5,223'TV	5,464'MD, 5,223' TV	7-7/8"

METHOD OF EMPLACEMENT OF CEMENT PLUGS
- [x] The Balance Method
- [ ] The Dump Bailer Method
- [ ] The Two-Plug Method
- [ ] Other

CEMENTING TO PLUG AND ABANDON DATA:	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches	5-1/2"	5-1/2"	5-1/2"	5-1/2"	5-1/2"		
Depth to Bottom of Tubing or Drill Pipe (ft	CIBP	5059'TV	CIBP	1060'TV	375'TV		
Sacks of Cement To Be Used (each plug)		10		10	45		
Slurry Volume To Be Pumped (cu. ft.		11.8		11.8	11.8		
Calculated Top of Plug (ft.)	5059'TV	5009'TV	1060'TV	1010'TV	Surface		
Measured Top of Plug (if tagged ft.	5059'TV	5009'TV	1060'TV	1010'TV	Surface		
Slurry Wt. (Lb./Gal.)		14.3		14.3	14.3		
Type Cement or Other Material (Class III)		Class A		Class A	Class A		

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (if any)

From	To	From	To
Perforations: 5114' TV	5130' TV (Dresbach to Mt Simon)	S#3 Open Hole: 5239' TV	5355' TV (in Mt. Simon)
HD1 Open Hole: 5223' TV	5261' TV (in Mt. Simon)	Perforations: 1070' TV	1230' (Base Det R Gp to Bois Bln
S#1 Open Hole: 5256' TV	5377' TV (in Mt. Simon)		
S#2 Open Hole: 5239' TV	5321' TV (in Mt. Simon)		

Estimated Cost to Plug Wells

CIBP to be set at 5059' TV and 1060'

Cmt: $6,435.00, Rig: $4,200.00, (CIBP's, tbg rental, welder, backhoe, supervision, water truck = $8,160.00) Tot = $18,795.00

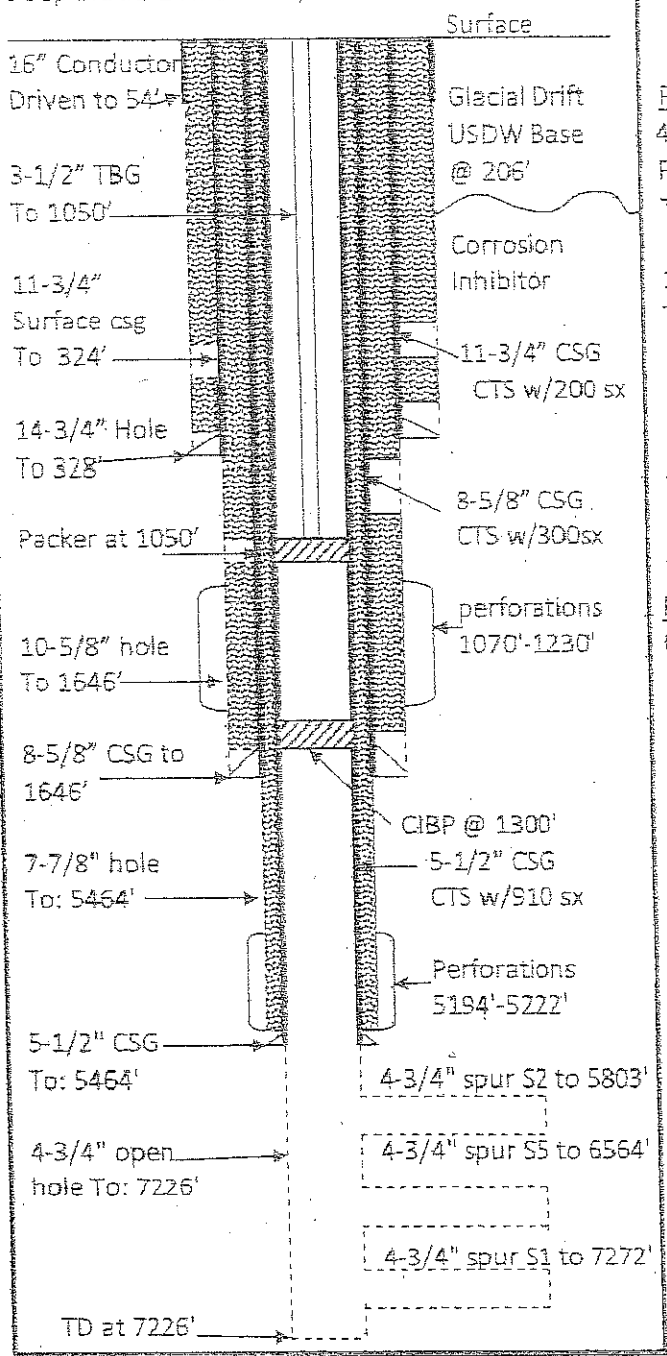
Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

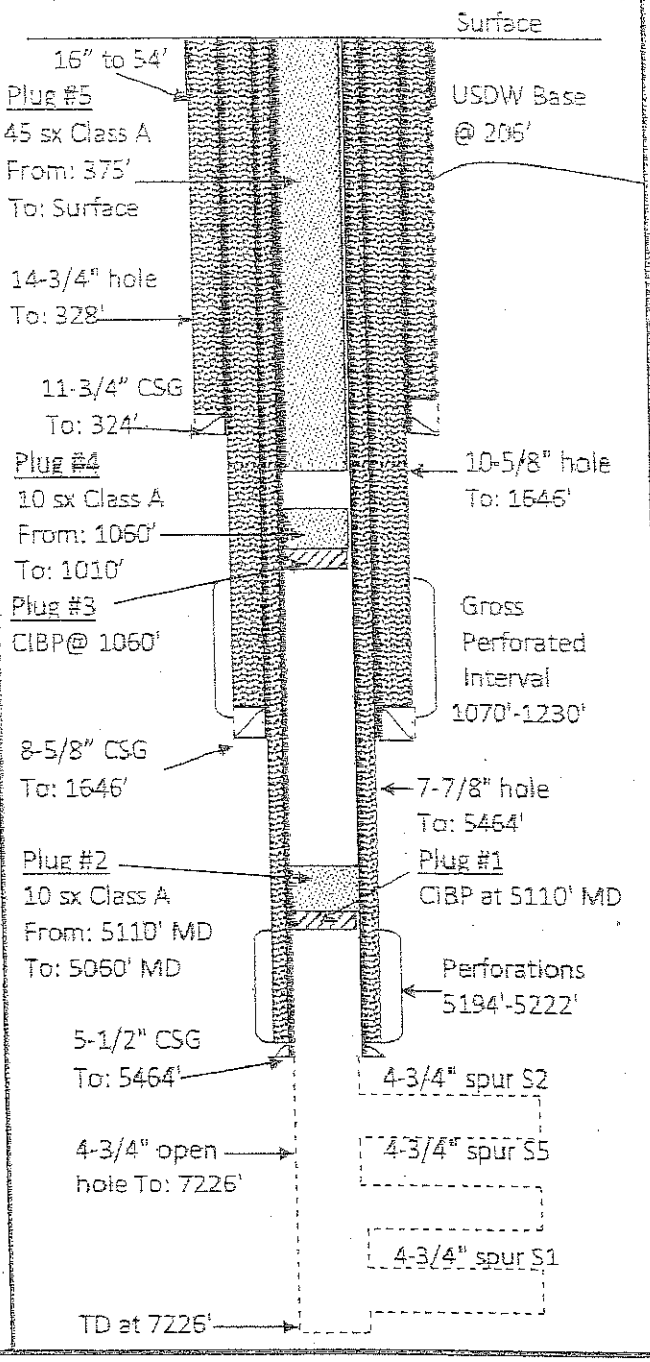
Name and Official Title (Please type or print)	Signature	Date Signed
Terry Blake, Operating Partner		5/12/2015

EPA Form 7520-14 (Rev. 12-98)

Final Well Construction During Operation
Deep Blu #1-2 HD1 BDW, MI-147-2D-0022

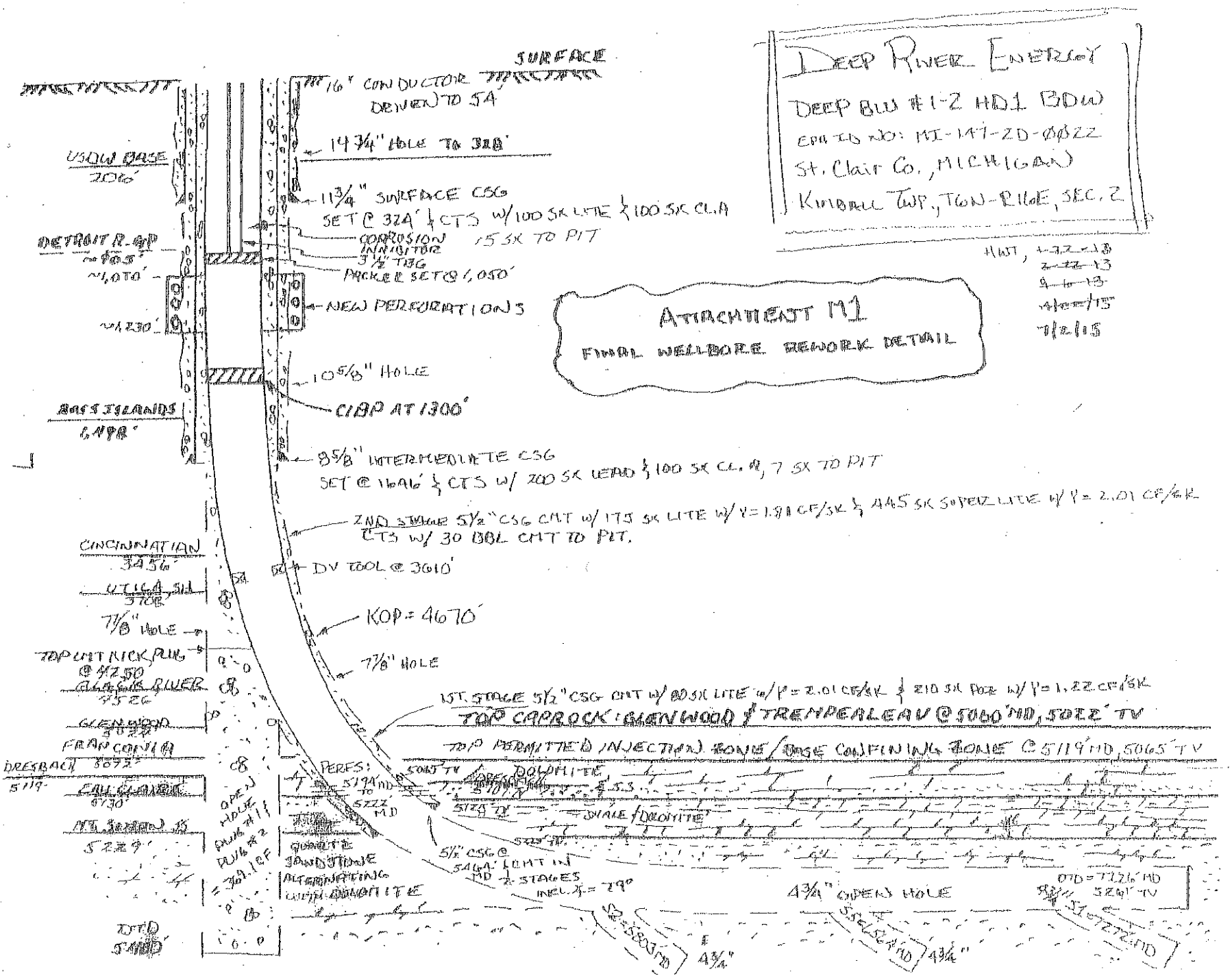


Plugging and Abandonment Construction
Deep Blu #1-2 HD1 BDW, MI-147-2D-0022



LIST OF ALL OPEN AND/OR PERFORATED INJECTION INTERVALS AND WHERE CASING WILL BE VARIED

Open Hole/Perforations	From	To	Formation Name	From	To	Formation Name
Open Hole HD1	5,464'	7,226'	Eau Claire & Mt. Simon	1,150'	1,170'	Amherstburg (perforated)
Open Hole S1	7,040'	7,272'	Mt. Simon	1,135'	1,146	Richfield (perforated)
Open Hole S2	5,581'	5,803'	Mt. Simon			
Open Hole S5	6,311'	6,564'	Mt. Simon			
Perforations	5,194'	5,212'	Dresbach Formation			
Perforations	5,212'	5,222'	Eau Claire			
Perforations	1,222'	1,226'	Bois Blanc			



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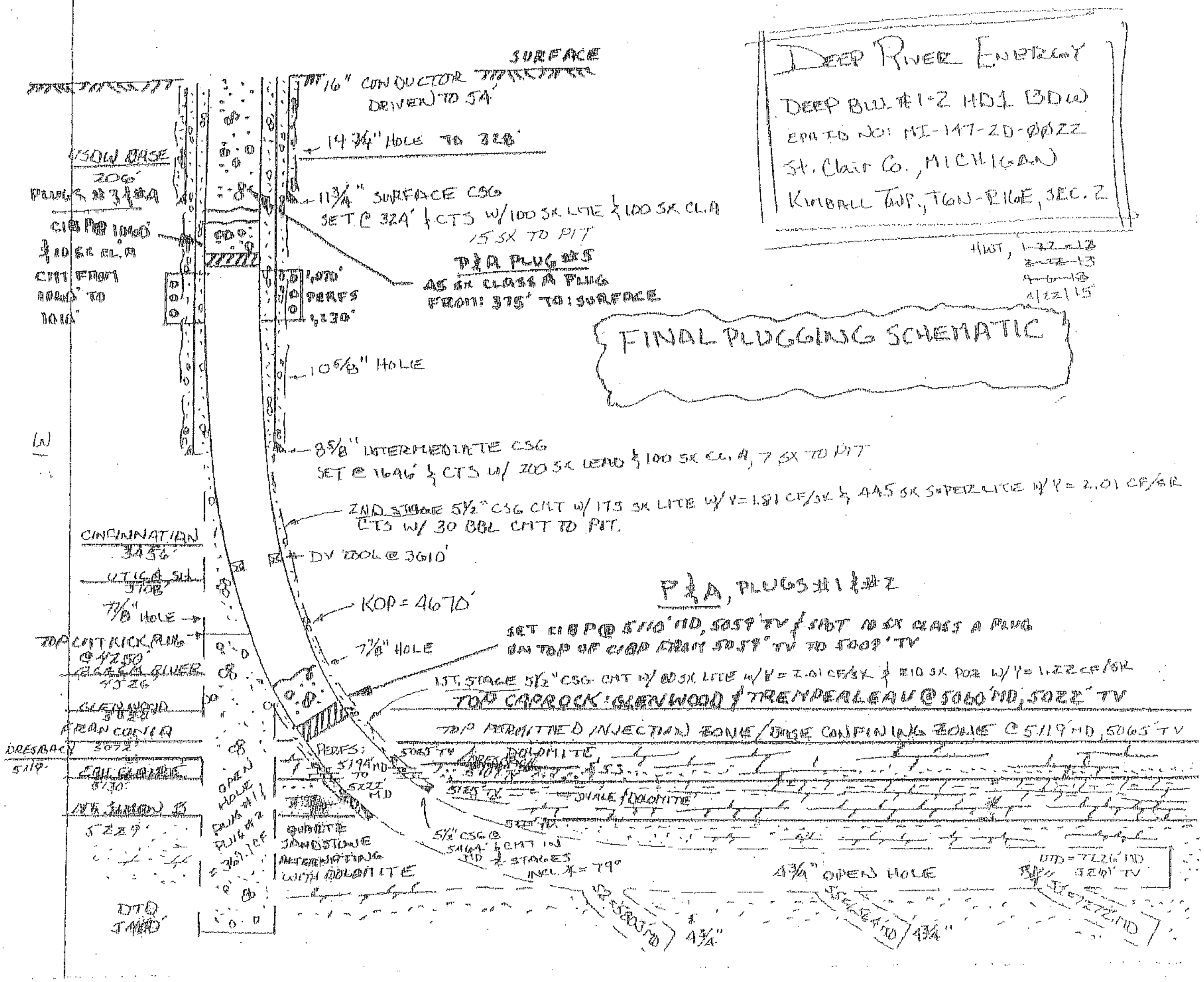
DEEP RIVER ENERGY
DEEP BLU #1-2 HD1 BDW
EPA ID NO: MI-147-2D-0022
St. Clair Co., MICHIGAN
KIMBALL TWP, T6N-R16E, SEC. 2
FINAL PLUGGING SCHEMATIC
SURFACE
16" CONDUCTOR DRIVEN TO 54'
14 3/4" HOLE TO 328'
11 3/4" SURFACE CSG SET @ 324' & CTS W/100 SK LITE & 100 SK CL.A 15 SX TO PIT
P&A PLUG #5 AS SX CLASS A PLUG FROM: 375' TO: SURFACE
10 5/8" HOLE
8 5/8" INTERMEDIATE CSG SET @ 1696' & CTS W/ 200 SX LEAD & 100 SX CL. A, 7 SX TO PIT
2ND STAGE 5 1/2" CSG CMT W/ 175 SK LITE W/ Y=1.81 CF/SK & 445 SK SUPERLITE W/ Y=2.01 CF/SK CTS W/ 30 BBL CMT TO PIT.
DV TOOL @ 3610'
KOP = 4670'
7 7/8" HOLE
P&A, PLUGS #1 & #2
1ST STAGE 5 1/2" CSG CMT W/ 80 SX LITE W/ Y=2.01 CF/SK & 10 SX POZ W/ Y=1.22 CF/SK
TOP CAPROCK: GLENWOOD & TREMPEALEAU @ 5060' MD, 5022' TV
TOP PERMITTED INJECTION ZONE/BASE CONFINING ZONE @ 5119' MD, 5065' TV
PERFS: 5194' MD TO 5222' MD
SHALE/DOLOMITE
5 1/2" CSG @ 5464' & CMT IN 2 STAGES
INCL. = 79°
4 3/4" OPEN HOLE
4 3/4"
USDW BASE 206'
1,070' PERFS 1,130'
CMT FROM 1,065' TO 1,016'
CINCINNATIAN 3456'
UTICA SH. 3708'
7 7/8" HOLE
TOP CMT KICK PLUG @ 4250'
BLACK RIVER 4326'
GLENWOOD 5022'
FRANCONIA 5072'
DRESBACH 5119'
EAU CLAIRE 5130'
MT. SIMON 5229'
OPEN HOLE PLUG #1 PLUG #2
QUARTZ SANDSTONE ALTERNATING WITH DOLOMITE
DTD

CORRECTIVE ACTION PLAN

There is no corrective action at this time

LIST OF PRESENTLY APPROVED SOURCES

Presently there are 2 approved sources of oil field brine being disposed of into the Deep Blu #1-2 HD1 BDW injection well. They are identified below by field name, location and formation name. Future sources, as approved by the Director, will be added to this Part III (D) of the permit. A complete chemical analysis of each source of brine that makes up the injection fluid is included in the administrative record for this permit. No fluids other than those from sources noted in Part III (D) of the permit shall be injected.

Source #	Field Name	Location	Formation Name
1	East China Field	T4N-R16E-S25	Niagaran
2	Pembina Propane Storage Field	Moore Township Concession XI; Lot 25; Tracts 1, 2, 3 and 4. Moore Township Concession XII; Lot 23 and Lot 24; Tracts 4, 5, 6 and 8. Lambton County, Ontario, Canada	Salina Group